SYSTEMATIC REVIEWS TO HELP GUIDE CLINICAL PRACTICE IN NEUROMUSCULAR DISEASE

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Doctors face an impossible task in appraising, synthesising, and regularly revisiting the evidence, even in a relatively small field such as neuromuscular disease. Randomised controlled trials are the most powerful tool for assessing and comparing the efficacy of different interventions.[1] With the possible exceptions of interventions with very large or very small effect sizes,[2 3] they provide the best research design to address questions of therapeutic efficacy. Properly designed randomised controlled trials minimise selection bias by ensuring the homogeneity of the comparison groups from the very start of the trial. Interventions for neuromuscular disease need testing in randomised trials as much as interventions in any other field. However, most neuromuscular diseases are uncommon so that collecting sufficient patients to answer even simple questions about interventions with moderate effects is difficult.

MINIMISING BIAS

Conventional reviews of treatment risk bias from failure to identify all trials, inclusion of flawed trials, the personal opinion of the author and, often, lack of peer review. The Cochrane Collaboration, which was established in 1992, has been at the forefront of the effort to develop methods for systematic reviewing which minimise bias.[4 5]

Methods adopted by the Cochrane Neuromuscular Disease Group to minimise bias include:

- authorship of reviews by individuals from more than one institution
- peer review and prior publication of the methods for the review in a protocol, which is available for criticism or comment by anyone interested
- a comprehensive search for randomised controlled trials in all languages (box 1)
- independent quality assessment by at least two reviewers (box 2)
- independent data extraction by two reviewers on specially designed data extraction forms
- contact with authors of trial reports to obtain missing data
- a rigorous peer review and editing process
- the facility for readers to comment on reviews after publication, and publication of authors' response to comments
- regular updating of reviews (at least every two years).

Where appropriate, the results are combined in a single statistical expression of the efficacy of the treatment, or meta-analysis. Although Cochrane reviews for the most part focus on reviewing the randomised evidence, our group likes this put in the context of other relevant research and published expert opinion. The discussion should also consider adverse events and health economic factors which are rarely adequately dealt with in randomised trials.

Cochrane reviews have been shown to be less biased and more systematic than systematic reviews published in traditional medical journals.[6 7]

COCHRANE NEUROMUSCULAR DISEASE GROUP

The Cochrane Neuromuscular Disease Group has the responsibility for reviewing the whole range of neuromuscular diseases, including disorders of the muscle, neuromuscular junction, peripheral nervous system, and lower motor neuron. We cover all interventions including prevention, acute treatment, and rehabilitation. Box 3 contains a list of 19 published reviews. We have identified over 170 interventions requiring review. If you would like to contribute to this task or have questions, please contact the coordinator, Cochrane Neuromuscular Disease Group (kate.jewitt@kcl.ac.uk and website http://www.kcl.ac.uk/cochranenmd).

ACCESSING THE COCHRANE LIBRARY

Cochrane reviews are published in the Cochrane Database of Systematic Reviews, part of the Cochrane Library. The Library is published quarterly and is available on the internet and CD-ROM. Abstracts of all Cochrane reviews can be found on the Cochrane Collaboration website at: http://www.update-software.com/ccweb/cochrane/revabstr/mainindex.htm

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Box 1: The Cochrane Central Register of Controlled Trials (CENTRAL)

- CENTRAL is a register of over 300 000 bibliographic references to trial reports in all languages for inclusion in systematic reviews
- CENTRAL is compiled by systematic searching of other electronic databases including Medline and Embase, trials identified by checking bibliographies, trials identified by hand searching journals and conference proceedings, and references to unpublished and ongoing studies

Box 2: Criteria used to assess methodological quality of studies

- Adequate generation of the allocation sequence
- Adequate allocation concealment
- Participant and observer blinding
- Loss to follow up
- Intention to treat analysis

National Health Service staff in England and Wales have free access to the Cochrane Library via the National Electronic Library for Health at http://www.nelh.nhs.uk/cochrane.asp. For information on other national provisions visit: http://www.update-software.com/Cochrane/provisions.htm

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3 **Benson K**, Hartz AJ. A comparison of observational studies and randomized, controlled trials. *N Engl J Med* 2000;**342**:1878–86.
4 **Clarke M**, Oxman AD, eds. Cochrane Reviewers Handbook 4.1.5 (updated April 2002). In: The Cochrane Library, Issue 2, 2002. Oxford: Update Software.
5 **Chalmers I**, Altman D, eds. *Systematic reviews*. London: BMJ Publishing Group, 1995.
6 **Jadad AR**, Moher M, Browman GP, *et al*. Systematic reviews and meta-analyses on treatment of asthma: critical evaluation. *BMJ* 2000;**320**:537–40.
7 **Egger M**, Davey Smith G, Schneider M, *et al*. Bias in meta-analysis detected by a simple, graphical test. *BMJ* 1997;**315**:629–34.

Box 3: Reviews published by the Cochrane Neuromuscular Disease Group

Amyotrophic lateral sclerosis
- Recombinant human insulin-like growth factor 1 (rhIGF-1) for amyotrophic lateral sclerosis/motor neuron disease
- Riluzole for amyotrophic lateral sclerosis/motor neuron disease

Anti-myelin associated, glycoprotein associated peripheral neuropathies
- Immunotherapy for IgM paraprotein anti-myelin associated glycoprotein antibody associated peripheral neuropathies

Bell's palsy
- Aciclovir for Bell's palsy (idiopathic facial paralysis)
- Corticosteroids for Bell's palsy (idiopathic facial paralysis)

Carpal tunnel syndrome
- Local corticosteroid injection for carpal tunnel syndrome
- Non-surgical treatment (other than steroid injection) for carpal tunnel syndrome
- Surgical treatment options for carpal tunnel syndrome
- Surgical versus non-surgical treatment for carpal tunnel syndrome

Chronic hyperventilation
- Nocturnal mechanical ventilation for chronic hypoventilation in patients with neuromuscular and chest wall disorders

Chronic inflammatory demyelinating polyradiculoneuropathy
- Corticosteroid treatment for chronic inflammatory demyelinating polyradiculoneuropathy
- Cytotoxic drugs and interferons for chronic inflammatory demyelinating polyradiculoneuropathy
- Intravenous immunoglobulin for chronic inflammatory demyelinating polyradiculoneuropathy

Guillain-Barré syndrome
- Corticosteroids for Guillain-Barré syndrome
- Intravenous immunoglobulin for Guillain-Barré syndrome
- Plasma exchange for Guillain-Barré syndrome

Multifocal motor neuropathy
- Immunosuppressive treatment for multifocal motor neuropathy

Myasthenia gravis
- Plasma exchange for myasthenia gravis

Myotonic dystrophy
- Psychostimulants for hypersomnia in myotonic dystrophy